

REMARKS

This application has been reviewed in light of the Office Action dated February 26, 2007. Claims 1-26 are pending in the application. No new matter has been added. The Examiner's reconsideration of the rejection in view of the amendment and the following remarks is respectfully requested.

By the Office Action, the Examiner warned that duplicate claims may exist and that should claims 1-10 be found to be allowable an objection to claims 11-17 (or vice versa) would be issued. It is respectfully submitted that claims 1 and 11 are not believed to be substantial duplicates of one another.

Claim 11 includes at least the language "... a set of storage elements which may store a copy of the object; instructing each storage element in the set to invalidate a copy of the object; and performing the update after each storage element in the set indicates that the storage element has invalidated a copy of the object or the storage element is determined to be unresponsive."

However, should claim 1 or claim 11 be deemed allowable, the Applicant will consider canceling of one of the two sets of claims.

By the Office Action, claims 1-6, 10-12, 16-24 and 26 stand rejected under 35 U.S.C. §102(e) and §102(a) (PLEASE NOTE THE COMMON INVENTORS) as being anticipated by U.S. Patent Application Publication No. 2003/0172236 to Iyengar et al. (hereinafter Iyengar).

Claim 1 of the present invention, includes, *inter alia*, a method including ...

instructing the storage elements, which the consistency coordinator suspects store a copy of the object, to invalidate their copy of the object, and performing an update of the object after each storage element that includes the copy of the object indicates that the storage element has invalidated the copy of the object or the storage element is determined to be unresponsive.

It is respectfully submitted that the Examiner has failed to appreciate the distinguishable differences between the Iyengar and the present claims. At least with respect to the step of “performing an update of the object after each storage element that includes the copy of the object indicates that the storage element has invalidated the copy of the object or the storage element is determined to be unresponsive”, the Examiner has not considered that the update procedure provided in accordance with the present claims is restricted to just those storage elements that have invalidated the object. In other words, the consistency coordinator waits to receive a confirmation that a storage element has invalidated an object before an update is sent to the storage element. The update is sent only to the storage element with the invalidated object and only after the storage element indicates that the object has been invalidated.

The present claims selectively target those storage elements that include an object to be updated by: “instructing the storage elements, which the consistency coordinator suspects store a copy of the object, to invalidate their copy of the object, and performing an update of the object after each storage element that includes the copy of the object indicates that the storage element has invalidated the copy of the object or the storage element is determined to be unresponsive”. This is not taught in Iyengar.

The present steps provide for selective identification of which storage elements

are to be updated. The storage elements invalidate the object and report this to the coordinator. Then, the coordinator sends an update only to those storage elements that have invalidated the object (or were unresponsive). If a storage element invalidates its copy of an object – the storage element indicates that the storage element has invalidated the copy. Only those that invalidate their copy are updated. The present claims provide that the updating is restricted to only those storage elements that have indicated that they have invalidated the object. There is no suggestion or equivalent recitation of these steps in Iyengar.

The Examiner cites paragraph [0011] of Iyengar stating that “updates to cached objects may go through the central cache. In order to update a cache object, the central cache may communicate with the local caches to make sure that all copies are invalidated or updated (paragraph 0011)”. The Applicant believes that this citation should be construed to mean that the central cache goes through all of the objects stored in each storage element to see if the objects are up-to-date. The action is by a central cache that checks all of the caches for outdated copies of an object. This interpretation is supported by the disclosure in paragraphs [0039] and [0040] of Iyengar. While the local caches may communicate with the central cache, the central cache of Iyengar does not wait for the storage elements to invalidate their copy, indicate the invalidation, and then perform an update on only the storage elements indicating the invalidation.

The steps set forth in the present claims are not taught either implicitly or explicitly by Iyengar. Instead, it appears that the central cache in Iyengar simply checks to see that invalidations and updates have been performed by checking all objects to see if they include the correct information. Iyengar does not teach conditioning an update based on

invalidations reported by a select number of storage elements.

Therefore, Iyengar does not teach, *inter alia*, “instructing the storage elements, which the consistency coordinator suspects store a copy of the object, to invalidate their copy of the object, and performing an update of the object after each storage element that includes the copy of the object indicates that the storage element has invalidated the copy of the object or the storage element is determined to be unresponsive”. There is no statement that a storage element invalidates its copy, indicates the invalidation and updates only the storage elements that indicated invalidation. Since these elements are not shown in the cited reference, claim 1 is believed to be in condition for allowance.

Claims 10, 11, and 17 include similar recitations as claim 1. Since Iyengar fails to teach all of the elements of the present claims, claims 1, 10, 11, and 17 and claims dependent therefrom are believed to be in condition for allowance for at least the stated reasons. Reconsideration of the rejection is earnestly solicited.

Claim 18 recites, *inter alia*, a system for maintaining strong data consistency comprising a plurality of storage elements, a consistency coordinator, which communicates with the plurality of storage elements and maintains information about which objects are stored in the plurality of storage elements, the consistency coordinator providing selective communication to storage elements which include an object to be updated such that for a given object update the consistency coordinator communicates with only those storage elements which include the object to be updated.

The present claim 18 includes a consistency coordinator that provides selective communication to storage elements which include an object to be updated such that for a given

object update the consistency coordinator communicates with only those storage elements which include the object to be updated. Such a feature is not suggested by Iyengar. The consistency coordinator can selectively communicate with those storage elements that actually include the object to be updated. For a given object update, the consistency coordinator communicates with only those storage elements that include the object to be updated. At least this feature is not taught by Iyengar. Reconsideration of this rejection is earnestly solicited.

Since Iyengar fails to teach all of the elements of the present claims, claim 18 is believed to be in condition for allowance for at least the stated reasons. In addition, the dependent claims are also believed to be in condition for allowance for at least the stated reasons. Reconsideration of the rejection is earnestly solicited.

Iyengar does not teach all of the elements of the present claims. It should be noted that an anticipation rejection is not supported by the present rejection. While the Examiner has cited 102(a) and 102(e) as the basis for rejection, it is believed that such a rejection is improper. The Examiner is respectfully requested to reconsider the rejection and permit the case to go to allowance. However, should the Examiner disagree, the Examiner is respectfully requested to reconsider the anticipation rejection in favor of an obvious-type rejection to permit the Applicant to consider a terminal disclaimer to permit the case to advance to an allowance.

By the Office Action, claims 7-9, 14-15 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Iyengar in view of U.S. Application Patent No. 2005/0128960 to Chang et al. (hereinafter Chang).

Chang is cited to cure the deficiencies of Iyengar, namely with respect to

heartbeat messages. While Chang includes heartbeat messages, these messages are employed in a different way. For example, in claims 8 and 9, Chang does not disclose or suggest an entity that declares itself down in response to failing to receive a heart beat.

Chang fails to cure the deficiencies of Iyengar as set forth above. Further claims 7-9, 14-15 and 25 are dependent from independent claims which are believed to be in condition for allowance and are therefore also believed to be allowable for at least the stated reasons. Reconsideration of the rejection is earnestly solicited.

It should be noted that the present application, Iyengar and Chang are all commonly assigned to the same entity, International Business Machines. The Applicant will consider filing a terminal disclaimer to overcome any obvious-type double patenting rejections. In any event, the Applicant believes that the prior art exclusion under §103(c) (MPEP 706.2) is applicable to one or more of the rejections made by the Examiner. Reconsideration is respectfully requested.

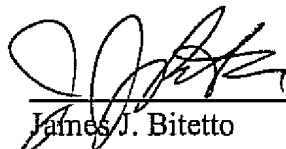
The Examiner is respectfully requested to call the undersigned after reviewing this document. It is believed that a verbal explanation of some of the concepts herein would be beneficial.

In view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

It is believed that no additional fees or charges are currently due. However, in the event that any additional fees or charges are required at this time in connection with the application, they may be charged to applicant's IBM Deposit Account No. 50-0510.

Respectfully submitted,

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